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# Taxonomic Novelties in *Andropogon* (Poaceae–Andropogoneae) for Brazil

Ana Zanin

Departamento de Botânica, Universidade Federal de Santa Catarina, Trindade, Florianópolis, Santa Catarina, 88040–900, Brazil. anazanin@terra.com.br

Hilda Maria Longhi-Wagner

Departamento de Botânica, Universidade Federal do Rio Grande do Sul, Avenida Paulo Gama, s.n., Porto Alegre, Rio Grande do Sul, 90046–900, Brazil. hmlw@vant.com.br

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**ABSTRACT.** *Andropogon brasiliensis* and *A. monocladus*, as well as a new variety, *A. ingratus* var. *hirsutus* from Brazil, are described. One new combination, *A. bogotensis* (Hackel) A. Zanin & Longhi-Wagner, is proposed. Morphological descriptions, illustrations, data on habitat, and geographical distribution are provided.

**RESUMO.** *Andropogon brasiliensis* e *A. monocladus*, bem como uma nova variedade, *A. ingratus* var. *hirsutus* para o Brasil, são descritas. Uma nova combinação, *A. bogotensis* (Hackel) A. Zanin & Longhi-Wagner é proposta. São fornecidas descrições morfológicas, ilustrações, dados sobre habitat e distribuição.

**Key words:** Andropogoneae, Brazil, Gramineae, Panicoideae, Poaceae.

The genus *Andropogon* L. includes ca. 100 species (Clayton & Renvoize, 1986) distributed throughout the tropics, with centers of species diversity in Africa and tropical America (Clayton & Renvoize, 1982). Thirty species occur in Brazil, including *A. gayanus* Kunth, introduced from Africa for cultivation. In Brazil, the greatest species diversity is found in “cerrado” and “campos rupestres” of the southeastern and central-western regions.

***Andropogon brasiliensis*** A. Zanin & Longhi-Wagner, sp. nov. TYPE: Brazil. Minas Gerais: mun. Congonhas do Norte, Serra da Carapina, 18°52'S, 43°14'W, 2 Mar. 1998, R. C. Forzza, J. R. Pirani, A. C. Marcato, M. C. Assis & A. Rapini 694 (holotype, SPF; isotypes, FLOR, K). Figure 1.

Habitu *A. macrothrix* affinis sed praecipue laminis foliorum brevioribus et angustioribus, spiculis pedicellatis longioribus et ligula membranaceo-ciliata differt. Laminae 3.5–17 × 0.05–0.2(0.4) cm, ligula membranaceo-ciliata,

inflorescentiae graciles, plerumque terminales tantum, 2–3(–5) ramis per spatheolam, spiculae pedicellatae (2–) 3.1–5 mm longae.

*Perennial*, caespitose; culms 34–64 cm tall, glabrous; 3 to 5 glabrous nodes. Leaf sheaths usually shorter than the internodes, glabrous; *blades* 3.5–17 × 0.05–0.2(–0.4) cm, linear, usually conduplicate, margins convolute or involute, apex acute or subobtuse, base straight, green on both faces, glabrous on abaxial face, puberulous on adaxial face, usually setose in the proximal portion, with marginal or submarginal hairs 2–5 mm long, apex scabrous on the margins; *ligule* 0.2–0.6 mm long, membranous ciliate. *Inflorescence* 2.5–6 cm long, lax, elongated, usually composed of terminal, or both terminal and axillary inflorescence units, these units with 2 to 3(to 5) non-branched flowering branches, equal or subequal in length, conjugate or subdigitate, exerted or partially enclosed by the spatheole; peduncle of the inflorescence unit 8–19 cm long; spatheole 5.5–14 cm long. *Pedicels and rachis internodes* 2–3(–4) mm long, linear, subequal in length, with hairs shorter than the sessile spikelet or as much as 1.5 times its length. *Sessile spikelet* 4.5–6.5 mm long, monoclinal, stramineous-green; *lower glume* 4.5–6.5 × 0.6–1 mm, slightly concave, lanceolate, bidentate, chartaceous, 4-nerved, without intercarinal nerves, without groove, scabrous on the upper third of the nerves, margins glabrous; *upper glume* 4.1–5 × 0.8–1.4 mm, acute or apiculate, chartaceous, 3-nerved, scabrous on the upper third of the central nerve, ciliate on the upper half of the margins; *lower lemma* 3.9–4.5 × 0.7–1 mm, hyaline or hyaline vinaceous, 2-nerved, ciliate on the upper half of the margins; *palea* absent; *upper lemma* 3–4 × 0.4–0.9 mm, perfect hyaline or stramineous hyaline, 3-nerved, glabrous or sparsely ciliate on the margins; apex bifid on the upper third or quarter, awned, awn 12–22 mm long; *palea* 1.2–2.8 × 0.3–0.7 mm, hyaline,



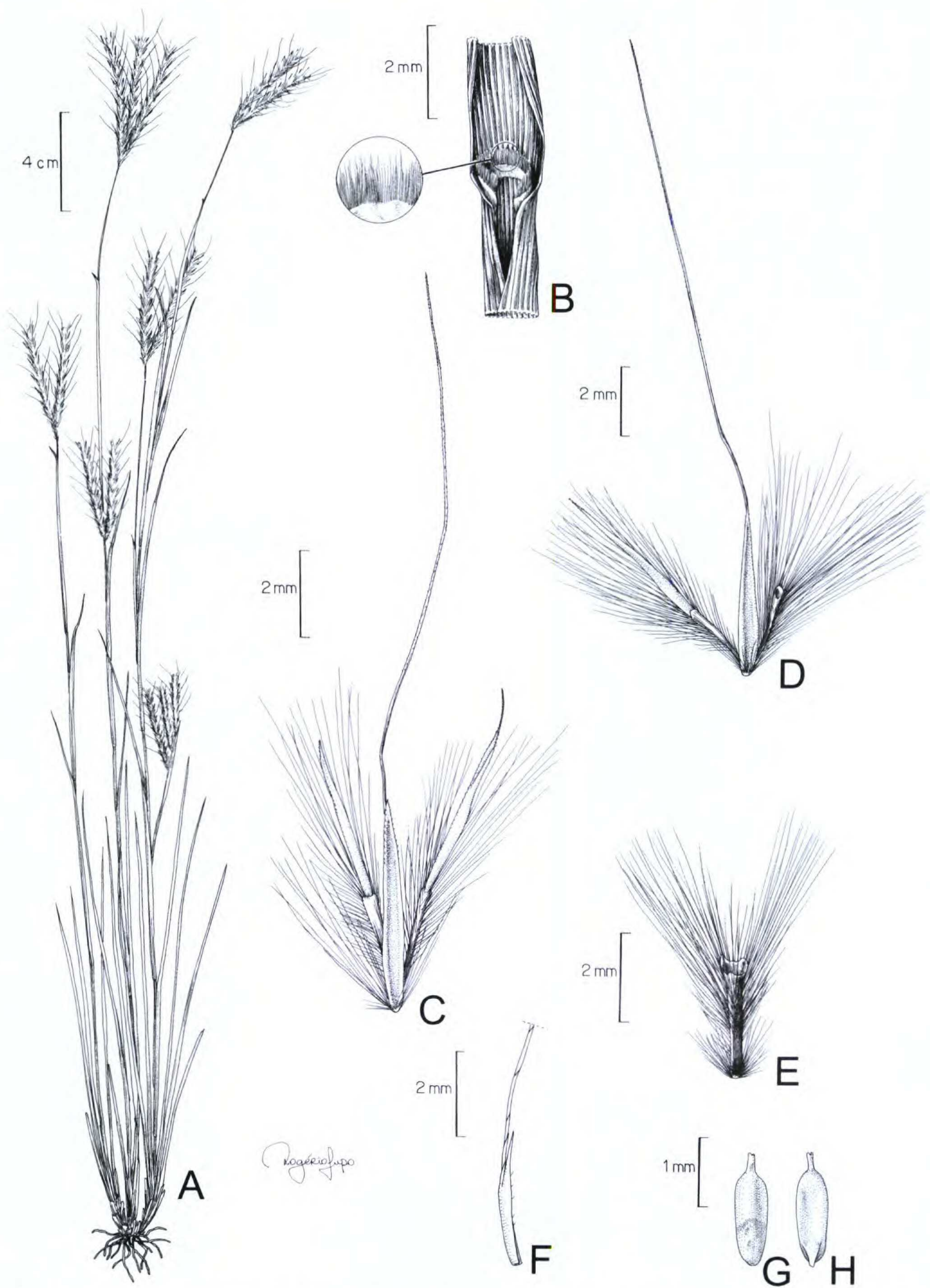


Figure 1. *Andropogon brasiliensis* A. Zanin & Longhi-Wagner. —A. Habit. —B. Ligule. —C. Terminal dispersal unit of the flowering branches. —D. Dispersal unit of the mid portion of the flowering branches. —E. Rachis internode. —F. Upper lemma of the sessile spikelet. —G. Caryopsis, dorsal view. —H. Caryopsis, ventral view. Based on R. C. Forzza et al. 694 (A), A. B. Joly et al. 1851 (B–F), and A. M. Giuliotti CFSC 7329 (G, H).



nerveless, acute or irregularly denticulate, glabrous or ciliate at the apex. *Lodicules* 2, ca. 0.7 mm long, glabrous; *stamens* 3, anthers 0.7–1.2 mm long, yellow. *Caryopsis* 1.5–1.8 × 2–3 mm. *Pedicellate spikelet* neuter, (2–)3.1–5 × 0.1–0.2 mm, shorter than or as long as the sessile spikelet, always narrower.

*Andropogon brasiliensis* occurs in “campos rupestres” of the Espinhaço Range as isolated individuals in humid, sandy, and rocky soils. The new species resembles *A. macrothrix* Trinius, but the plants are more delicate, with shorter leaf blades, up to 17 cm long and 2 mm wide. In *A. macrothrix*, the leaf blades are usually more than 2 mm wide and extend up to 38 cm long. Furthermore, *A. macrothrix* has terminal and axillary inflorescences that are more robust, with 2 to 11 flowering branches, and pedicellate spikelets 1.2 × 3.2 mm long, usually shorter than those of *A. brasiliensis*. The ligules of *A. brasiliensis* are membranaceous ciliate, while in *A. macrothrix* the ligules are membranous ciliolate or membranous with an erose apex.

*Paratypes.* BRAZIL. **Minas Gerais:** Diamantina, região da Bandeira, 12 km de Diamantina, ao sul da rodovia Diamantina–Belo Horizonte, 9–13 July 1977, A. G. Burman 25 (SP); Jaboticatubas, km 141 ao longo da rodovia Lagoa Santa–Conceição do Mato Dentro–Diamantina, 17 Apr. 1972, A. B. Joly et al. 1851 (ICN, SP, SPF); Lima Duarte, Serra do Ibitipoca, Pico do Pião, 20 July 1998, A. Zanin et al. 740 (FLOR), 23 Mar. 1999, L. G. Rodela 1C–3 (FLOR); Santana do Riacho, km 137 ao longo da Rodovia Belo Horizonte–Conceição do Mato Dentro, s.d., A. M. Giullietti et al. CFSC 7329 (SPF); São Tomé das Letras, 11 June 1987, S. C. Pereira & M. H. Lagoa s.n. (ESAL 7677, IBGE 20138); morro da entrada da cidade, direção Baependi–São Tomé das Letras, 6 Dec. 1997, A. Zanin & H. M. Longhi-Wagner 673 (FLOR); Tiradentes, 26 June 1986, S. C. Pereira s.n. (ESAL 6537).

***Andropogon monocladius*** A. Zanin & Longhi-Wagner, sp. nov. TYPE: Brazil. Brasília, Reserva Ecológica do IBGE, 4 Aug. 1979, E. P. Heringer et al. 1716 (holotype, IBGE; isotypes, CEN, ICN, SP, UEC). Figure 2.

*A. lateralis* subsp. *lateralis* affinis, sed ramo florifero unico per spatheolam praedito et plantis robustis 170–250 cm longis distat.

*Perennial*, caespitose; culms 170–250 cm tall, glabrous; 9 to 10 glabrous nodes. Leaf sheaths longer and/or shorter than the internodes, villous or hirsute; *blades* (22–)50–70 × 0.5–0.7 cm, linear, flat, apex obtuse or abruptly acute, base straight, glaucous and villous or hirsute on both faces, less frequently glabrous, margins scabrous; *ligule* 1–1.2 mm long, membranous ciliolate. *Inflorescence* 2.5–5 cm long, lax, elongated, composed of terminal

and axillary inflorescence units, these units with one non-branched flowering branch, usually partially enclosed by the spatheole; peduncle of the inflorescence unit 1.5–6.5 cm long; spatheole 3.5–7 cm long. *Pedicels and rachis internodes* 2.2–3.5 mm long, linear, subequal in length, with hairs shorter than sessile spikelet. *Sessile spikelet* 4.5–5 mm long, monoclinal, castaneous, stramineous or stramineous-vinaceous; *lower glume* 4.5–5 × 1–1.1 mm long, slightly concave, lanceolate, chartaceous, 2-nerved, without intercarinal nerves, without groove, scabrous on the upper third or half of the nerves, margins glabrous, apex bidentate or erose; *upper glume* 3.5–4 × 0.8–1 mm, apiculate, chartaceous, 3-nerved, scabrous on the upper third or half of the central nerve, ciliate on the upper half of the margins; *lower lemma* 3–4 × 0.7–1 mm, hyaline, 2- to 3-nerved, ciliate on the upper half of the margins; *palea* absent; *upper lemma* 3–3.5 × 0.3–0.6 mm, perfect stramineous or stramineous hyaline, 1- to 3-nerved, glabrous on the margins; apex bifid on the upper third or fifth, awned, awn 8–9 mm long; *palea* 0.8–1.2 × 0.6 mm, hyaline, nerveless, irregularly dentate, glabrous. *Lodicules* 2, ca. 0.8 mm long, glabrous; *stamens* 3, anthers 0.6–1 mm long, yellow. *Caryopsis* 2–3 × 0.8 mm. *Pedicellate spikelet* usually staminate, rarely neuter in the same plant, neuter spikelet 3–3.5 × 0.2 mm; staminate spikelets 4.5–5.5 mm long, somewhat longer than the sessile spikelet, stramineous or stramineous-vinaceous, awnless; *lower glume* 4.5–5.5 × 1–1.2 mm, apiculate or erose, chartaceous, 5-nerved, scabrous on the upper half or third, especially on the nerves, glabrous on the margins; *upper glume* 4 × 1.5 mm, chartaceous, 3-nerved, erose, sparsely scabrous, especially on the nerves, glabrous or ciliate on the margins; *lower lemma* 3.5–4.2 × 1.2 mm, hyaline or hyaline-vinaceous, 1-nerved, ciliate on the upper half of the margins; *palea* absent; *upper lemma* 2.8–3.5 × 0.6–1 mm, hyaline, 1-nerved, ciliate on the upper half of the margins; *palea* 0.6 × 0.5 mm, hyaline, nerveless, irregularly dentate, glabrous. *Lodicules* 2, ca. 0.7 mm long, glabrous; *stamens* 3, anthers 2–2.5 mm long, yellow.

*Andropogon monocladius* occurs in marshes of the “cerrado,” in central Brazil and less frequently in the state of Bahia, also in marshes. The new species resembles *A. lateralis* Nees subsp. *lateralis* due to its well-developed and staminate pedicellate spikelets with the lower glume of the sessile spikelet slightly concave, without nerves or grooves between the keels. *Andropogon lateralis* subsp. *lateralis* differs by always having two or more flowering branch-



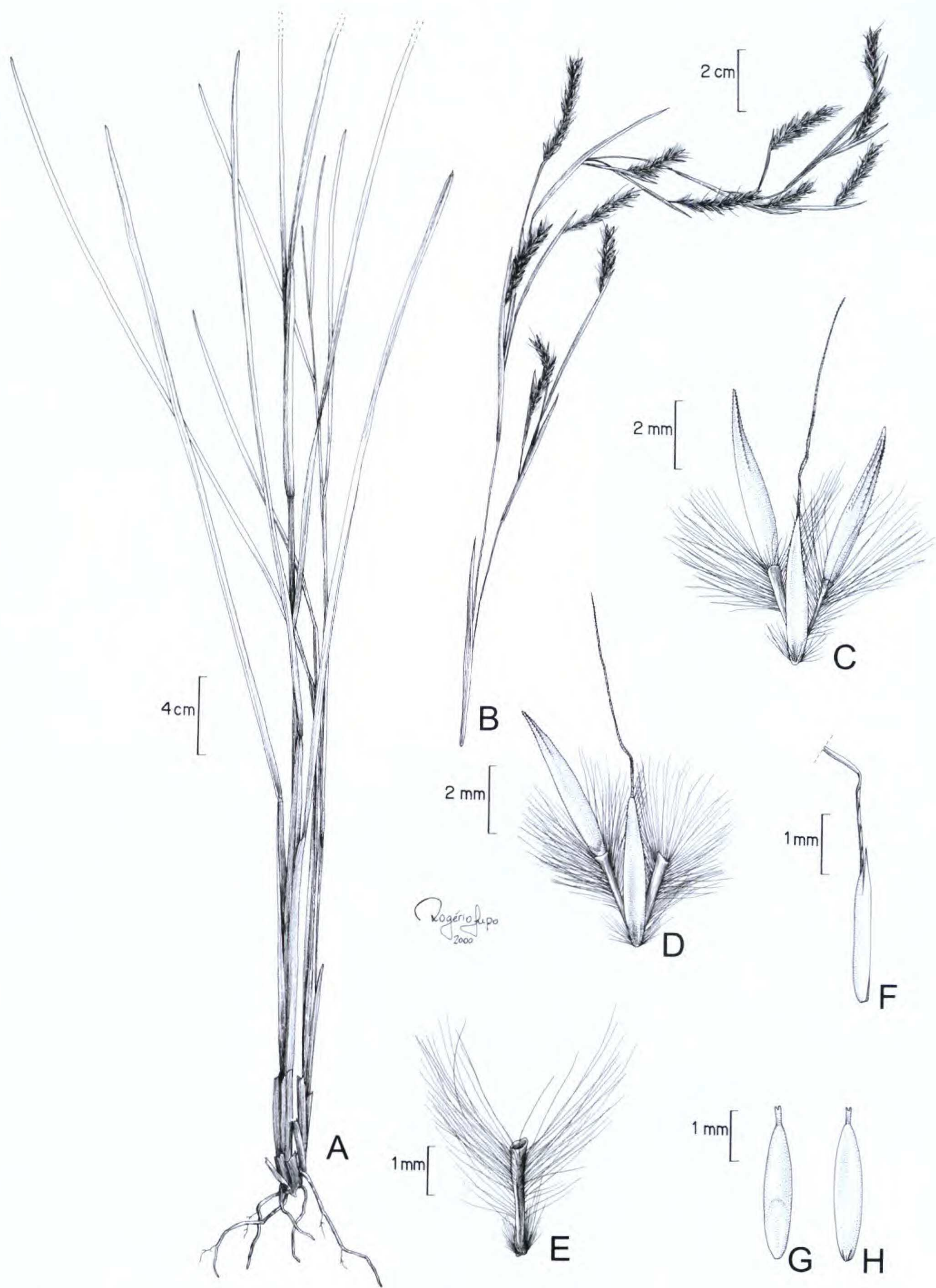


Figure 2. *Andropogon monocladus* A. Zanin & Longhi-Wagner. —A. Flowering culm, basal portion. —B. Flowering culm, apical portion. —C. Terminal dispersal unit of the flowering branches. —D. Dispersal unit of the mid portion of the flowering branches. —E. Rachis internode. —F. Upper lemma of the sessile spikelet. —G. Caryopsis, dorsal view. —H. Caryopsis, ventral view. Based on *P. S. Câmara & T. S. Filgueiras 118*.



es in each inflorescence unit and by the plants being smaller. Furthermore, its distribution is primarily in southern Brazil, while *A. monoclados* occurs in central Brazil.

*Paratypes.* BRAZIL. **Bahia:** Correntina, Fazenda Jatobá, 8 Aug. 1992, M. A. Silva *et al.* 1606 (IBGE). **Distrito Federal:** Brasília, Cristo Redentor, 15 Jan. 1991, P. S. Câmara & T. S. Filgueiras 118 (IBGE); Sobradinho, 27 Sep. 1965, H. S. Irwin *et al.* 8734 (US, foto). **Goiás:** Jataí, 30 July 1956, A. Macedo 4617 (IAC); Municipality not specified, s.d., Fazenda da Vargem, Glaziou 22366 (K, W).

***Andropogon ingratus* Hackel var. *hirsutus* A. Zanin & Longhi-Wagner, var. nov.** TYPE: Brazil. Bahia: Mun. Abaíra, Catolés de Cima, 23 Mar. 1999, A. Zanin 786 (holotype, SPF; isotype, FLOR). Figure 3.

Ab *A. ingratus* var. *ingratus* vaginis, laminis et spatheolis hirsutis differt.

*Perennial*, culms 50–110 cm tall. Leaf sheaths hirsute; *blades* 5–35 × 0.15–0.6 cm, glaucous on both faces, hirsute, especially on abaxial face, margins scabrous. *Inflorescence* 4–9 cm long, lax, elongated, composed of terminal and axillary inflorescence units, these units with 2 to 3(4) non-branched flowering branches. *Pedicels and rachis internodes* linear or subclavate, with hairs usually reaching the same length or twice the length of the sessile spikelet, less commonly shorter. *Sessile spikelet* 5–7 mm long, monoclinal; *lower glume* 4- to 7-nerved, slightly concave, with 2 to 5 intercarinal nerves, without groove; *upper lemma* 3–4 × 0.5–1 mm, stramineous hyaline, 3-nerved, apex bifid on the upper half or third, awned, awn 8–24 mm long; *stamens* 3, anthers 1.2–1.9 mm long, yellow. *Caryopsis* 2.5 × 0.6 mm. *Pedicellate spikelet* staminate or staminate and neuter, rarely only neuter in the same plant, the neuter spikelet 3.5–5.5 × 0.5–0.6 mm; staminate spikelets 4.2–7.2 mm long, shorter or longer than the sessile one; *stamens* 3, anthers 1.2–1.8 mm long, yellow.

*Andropogon ingratus* var. *hirsutus* occurs in high-altitude cerrado of Chapada Diamantina, Bahia, with one collection from Pernambuco.

The species *Andropogon ingratus* belongs to a group of species occurring in Brazil that are delicate and small in size, reaching only to 110 cm in height. The leaves are completely glaucous, and the flowering branches of the inflorescence units usually have dense, white hairs. The presence of 2 to 5 nerves between the keels of the lower glume of the sessile spikelet is a striking feature of this species. These nerves sometimes are only conspicuous

on the upper third or half of the glume, but are always present. The pedicellate spikelets are usually staminate, or staminate and neuter in the same plant, less frequently only neuter. Most of the studied material of *A. ingratus* var. *ingratus* showed leaves and spatheoles completely glabrous. Conversely, *Andropogon ingratus* var. *hirsutus* has hirsute sheaths and leaf blades (the latter on both faces), as well as the spatheoles, with long and snow-white hairs, making the plants stand out among the vegetation.

*Paratypes.* BRAZIL. **Bahia:** Abaíra, 17 km da cidade em direção a Catolés, 22 Mar. 1999, A. Zanin *et al.* 784 (SPF); Jussiape, estrada para Ibicoara, próximo ao Morro Branco, 20 Mar. 1999, A. Zanin *et al.* 778 (SPF). **Pernambuco:** Cachoeirinha, 21 Aug. 1969, E. C. Tenório 69–880 (IPA).

***Andropogon bogotensis* (Hackel) A. Zanin & Longhi-Wagner, comb. et stat. nov.** Basionym: *Andropogon incanus* Hackel var. *bogotensis* Hackel, in A. DC. & DC., Monogr. Phan. 6: 433. 1889. TYPE: Colombia. Apiai: Llano de S. Martín, Karsten s.n. in h. Vind. (holotype, W). Figure 4.

*Andropogon multiflorus* Renvoize, Gram. Bolivia: 596. 1998. Syn. nov. TYPE: Bolivia. La Paz: Iturrealde, Haase 1 (isotype, K).

*Andropogon bogotensis* has been collected in Brazil, Bolivia, and Colombia. In northern Bolivia, it occurs in the humid savanna of Beni and La Paz (Renvoize, 1998). In Colombia, it occurs in humid areas of the llanos de San Martín, near Bogotá. In Brazil, it has only been found in Minas Gerais, also in low humid areas and on the banks of small streams.

Hackel (1889) described *A. bogotensis* as a variety of *A. incanus* Hackel (= *A. lateralis* Nees) with densely branched inflorescences on the upper nodes of the culms, and awnless, sessile spikelets. Renvoize (1998: 596) described *A. multiflorus* based on the same characteristics, referring to the “spiculis sessilis muticis et inflorescencia ramosissima.” There is no doubt that the two taxa are the same. For this reason, we synonymize *A. multiflorus* and propose a new combination, *A. bogotensis*, extending its known distribution to Brazil.

*Andropogon bogotensis* resembles *A. lateralis* subsp. *lateralis* in the height of the plant, the many axillary inflorescences in the flowering culms, hairiness, the number of flowering branches in the inflorescence unit, and leaf blades glaucous on the adaxial face. However, in *A. bogotensis* the pedicellate spikelets are, for the most part, reduced in size and sterile, with few staminate pedicellate



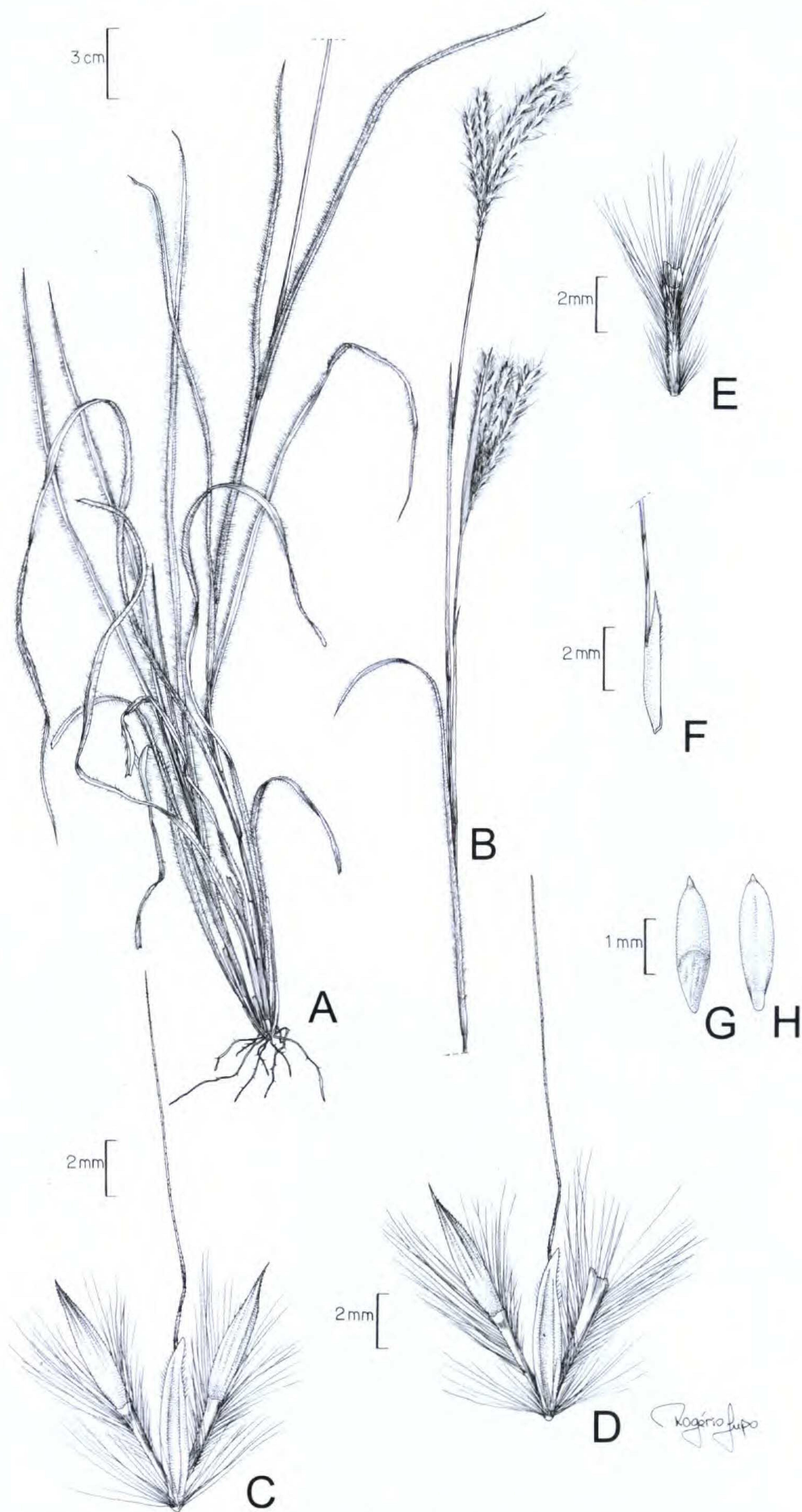


Figure 3. *Andropogon ingratus* Hackel var. *hirsutus* A. Zanin & Longhi-Wagner. —A. Flowering culms, basal portion. —B. Flowering culms, apical portion. —C. Terminal dispersal unit of the flowering branches. —D. Dispersal unit of the mid portion of the flowering branches. —E. Rachis internode. —F. Upper lemma of the sessile spikelet. —G. Caryopsis, dorsal view. —H. Caryopsis, ventral view. Based on A. Zanin *et al.* 786.



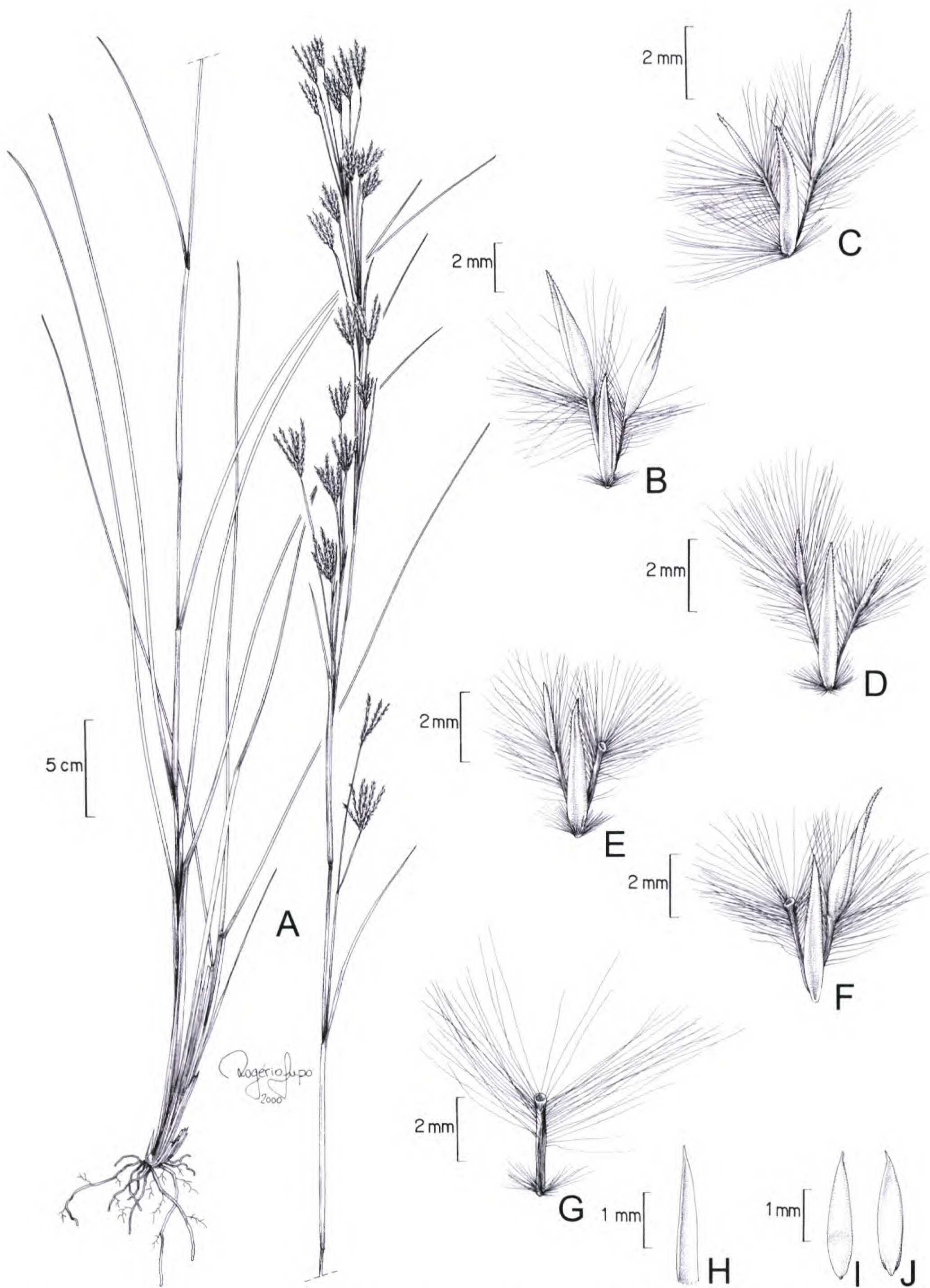


Figure 4. *Andropogon bogotensis* (Hackel) A. Zanin & Longhi-Wagner. —A. Flowering culm, basal and apical portion. —B. Terminal dispersal unit of the flowering branches showing two developed pedicellate spikelets. —C. Terminal dispersal unit of the flowering branches showing one well-developed and one rudimentary pedicellate spikelet. —D. Terminal dispersal unit of the flowering branches with two rudimentary pedicellate spikelets. —E. Dispersal unit of the mid portion of the flowering branches with one rudimentary pedicellate spikelet. —F. Dispersal unit of the mid portion of the flowering branches with one well-developed pedicellate spikelet. —G. Rachis internode. —H. Upper lemma of the sessile spikelet. —I. Caryopsis, ventral view. —J. Caryopsis, dorsal view. Based on A. Zanin & A. C. Araújo 719 (A–H) and A. Chase 10443 (I, J).



spikelets intercalated along and at the apex of the flowering branches, unlike *A. lateralis* subsp. *lateralis*, where the pedicellate spikelets are always well developed and staminate. In the holotype and most specimens of *A. bogotensis*, the sessile spikelets are awnless or with an awn 1 mm long. However, in specimens *A. G. Burman* 392, *A. Silveira* 1842, and *Macedo* 4908, the awns were observed to be 2–10 mm long combined with awnless spikelets in the same inflorescence. The muticous sessile spikelet and the smaller pedicellate spikelets give the inflorescence of *A. bogotensis* a much more delicate aspect than in *A. lateralis* subsp. *lateralis*.

*Specimens examined.* BRAZIL. **Minas Gerais:** Diamantina, Serra de Santo Antônio, 27–30 Dec. 1929, *A. Chase* 10443 (VIC), 19 Jan. 1984, *T. S. Filgueiras* & *A. G. Burman* 1086 (IBGE); 12 km de Diamantina, ao sul da rodovia Diamantina–Belo Horizonte, 9–13 July 1977, *A. G. Burman* 41 (SP); estrada de Sousa até São João da Chapada, 1 Apr. 1980, *A. G. Burman* 549 (SP); estrada Datas–Diamantina, BR 259, km 590, 10 Dec. 1997, *A. Zanin* & *A. C. Araújo* 716 (FLOR, SPF); saída da cidade, em direção a Biribiri, 11 Dec. 1997, *A. Zanin* & *A. C.*

*Araújo* 719 (FLOR, SPF); Lavras Novas, Serra de Itatiaia e Serra de Lavras Novas, 6 Sep. 1978, *A. G. Burman* 392 (SP); São João Del Rei, próximo a São João Del Rei, Oct. 1896, *A. Silveira* 1842 (R); Uberlândia, Estação de Supupira, 24 Jan. 1957, *A. Macedo* 4908 (IBGE, SP).

*Acknowledgments.* The authors are grateful to Tarciso Filgueiras for his assistance in the elaboration of the Latin diagnoses and to Rogério Lupo for the illustrations. The first author thanks CAPES-PICDT, and the second author thanks CNPq (Research Brazilian Council) for grants to support their work.

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